Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 1 of 45 Express Mail No. EV337190972US

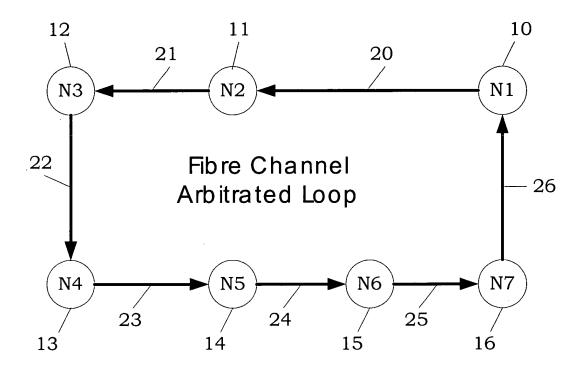


Fig. 1

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 2 of 45

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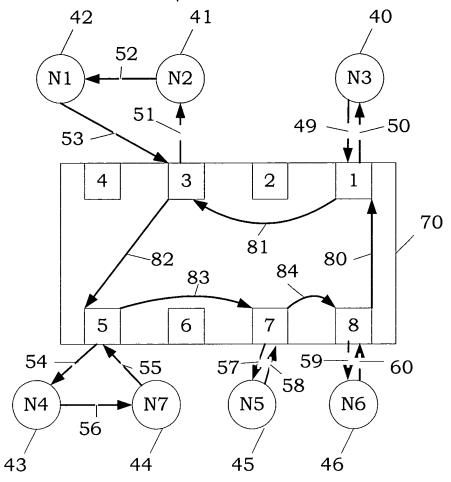
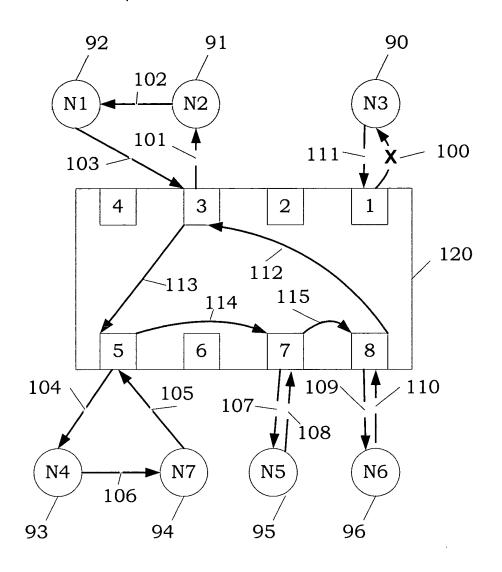


Fig. 2

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 3 of 45 Express Mail No. EV337190972US



Fibre Channel Arbitrated Loop Hub

Fig. 3

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 4 of 45 Express Mail No. EV337190972US

SWITCH LOGIC ROUTER

Fig. 4

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 5 of 45 Express Mail No. EV337190972US

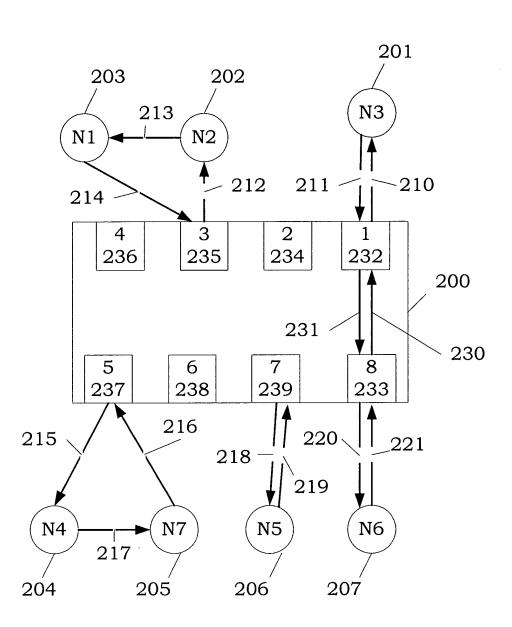


Fig. 5

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 6 of 45 Express Mail No. EV337190972US

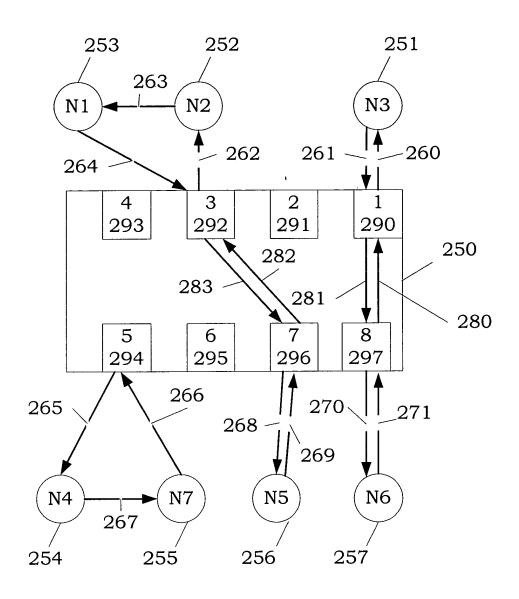


Fig. 6

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al.

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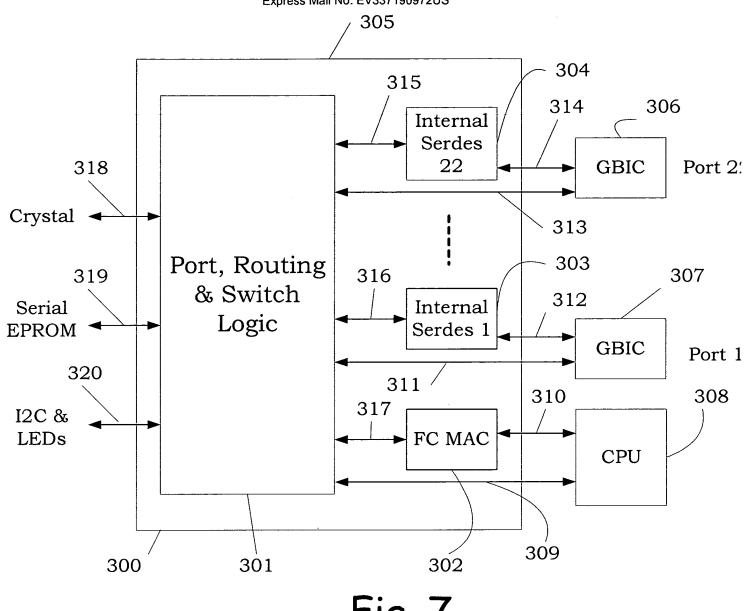


Fig. 7

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 8 of 45 Express Mail No. EV337190972US

400 401 430 Port Logic 402 Port Receiver OS Generator 404 with Parity OS 409 403 -Decode 411 428 405 20/16 Bit Elasticity 410 Port Decoder & Receive Check Retiming Parity Data Buffer parity Check 427 Logic 408 407 426 406 Router & Port Transmitter Switch 416 418 Logic OS 414 415 Generator 412 with 413 16/20 Bit Port **Parity** Encoder М Transmit Check 419 -Data parity 420 421 425 Parity 417 OS Check Decode 424 Logic 423 Port Control 422 -Control

Fig. 8

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 9 of 45 Express Mail No. EV337190972US

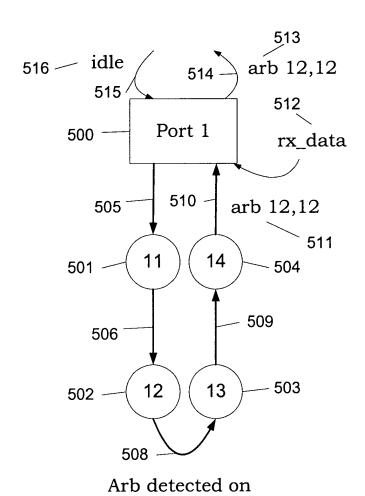
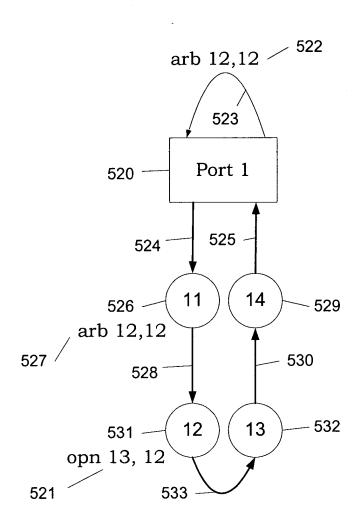


Fig 9a

port rx_data

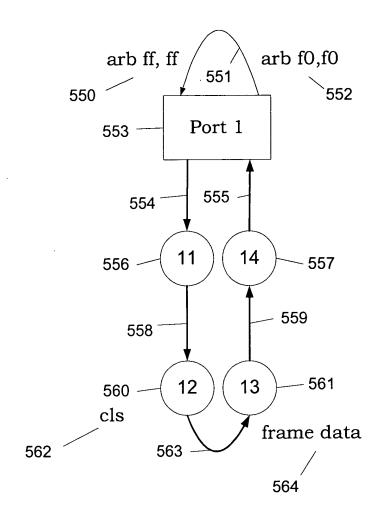
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 10 of 45 Express Mail No. EV337190972US



Connection established.
Open sourced

Fig 9b

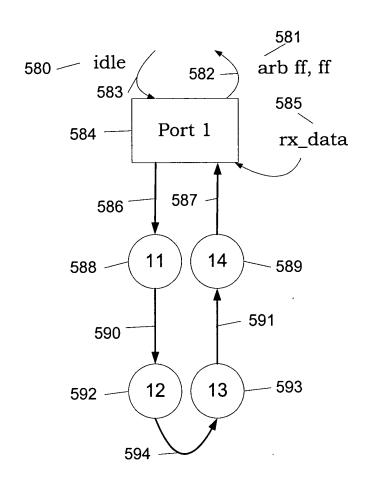
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 11 of 45 Express Mail No. EV337190972US



Arbf0 replaced with Arbff. Data Transfered. Close sourced.

Fig 9c

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 12 of 45 Express Mail No. EV337190972US

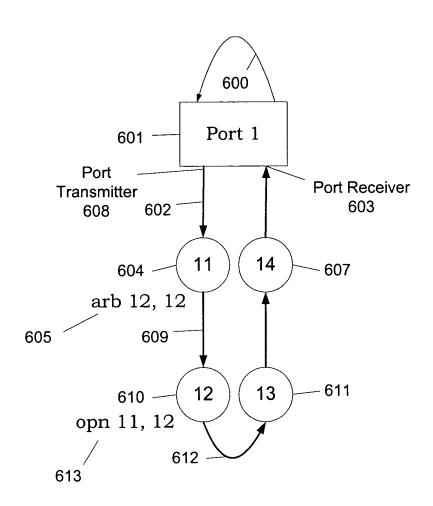


Arbff detected on port rx_data.

Disconnect. Source idles

Fig 9d

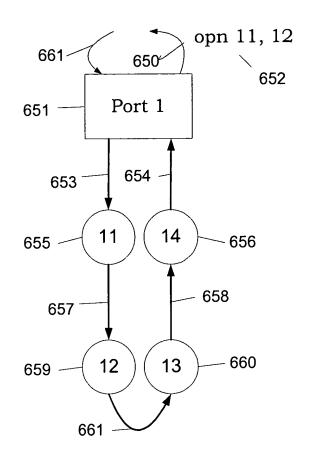
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 13 of 45 Express Mail No. EV337190972US



Arbs forwarded. Open sourced.

Fig 10a

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 14 of 45 Express Mail No. EV337190972US



Open detected at port receiver.

Port receiver holds open.

Provides ALPA to router and asserts opn_connect_req.

Fig 10b

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 15 of 45 Express Mail No. EV337190972US

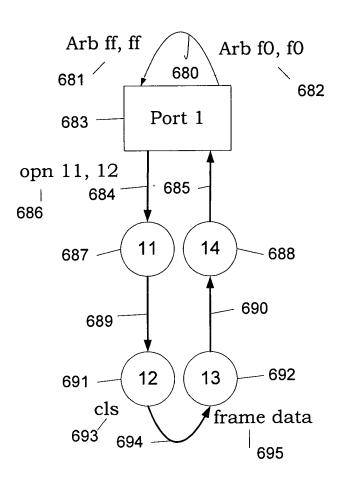
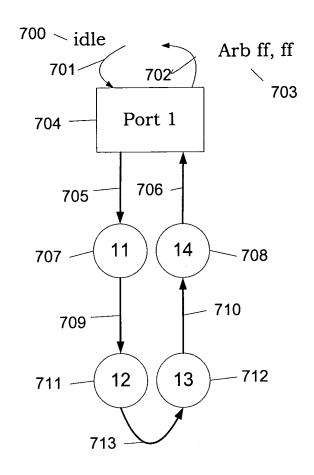


Fig 10c

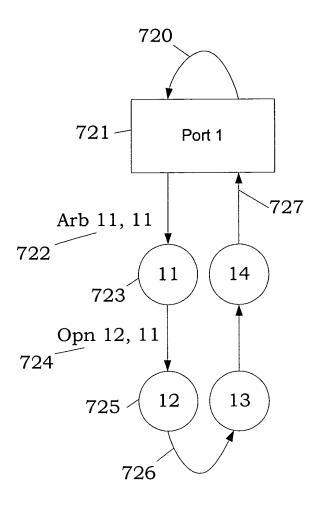
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 16 of 45 Express Mail No. EV337190972US



Arbff detected on port rx_data. Disconnect. Source idles.

Fig 10d

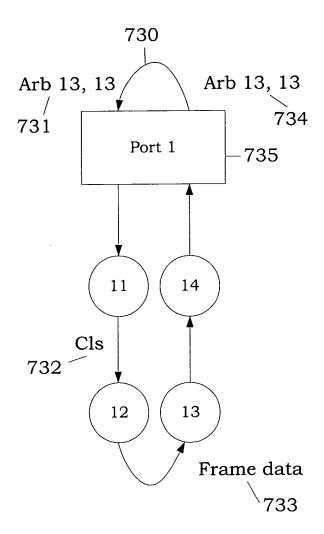
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 17 of 45 Express Mail No. EV337190972US



Arbs forwarded. Open Sourced.

Fig 11a

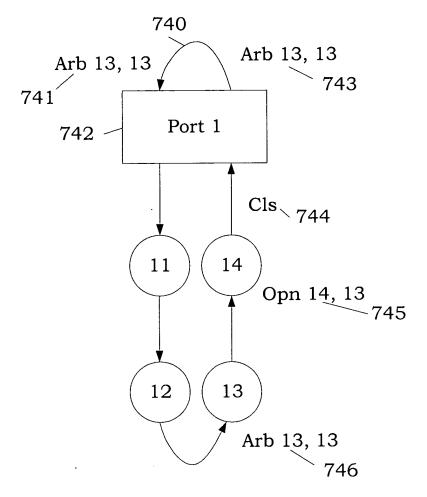
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 18 of 45 Express Mail No. EV337190972US



Arb 13 forwarded. Data Transfered. Close sourced.

Fig 11b

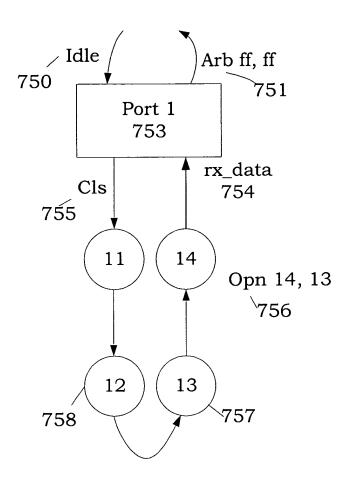
Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 19 of 45 Express Mail No. EV337190972US



Close forwarded by node 12. Arb 13 received by node 13. Open sourced by node 13.

Fig 11c

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 20 of 45 Express Mail No. EV337190972US



Close source by node 13.
Forwarded by node 12.
Arb ff Detected on port rx_data.
Disconnect.
Source idles.

Fig 11d

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 21 of 45 Express Mail No. EV337190972US

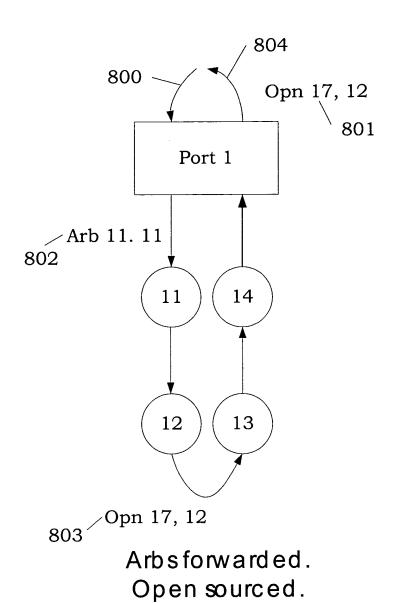
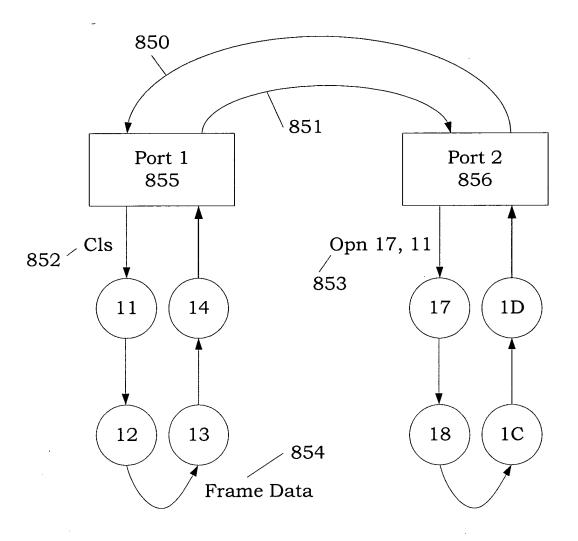


Fig 12a

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 22 of 45

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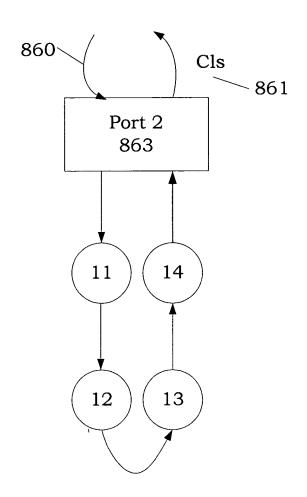


Open forwarded to Port 2. Open received from Port 1. Data transferred. Close sourced.

Data received. Close forwarded.

Fig 12b

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 23 of 45 Express Mail No. EV337190972US



Close detected at transmillter and receiver.
Connection broken.

Fig 12c

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 24 of 45 Express Mail No. EV337190972US

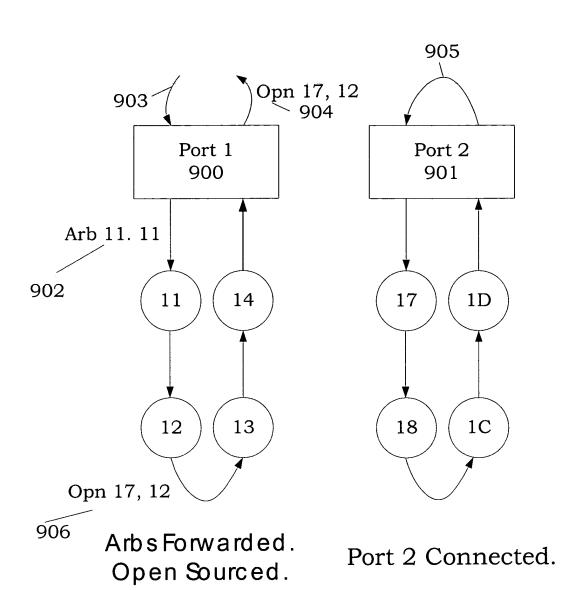
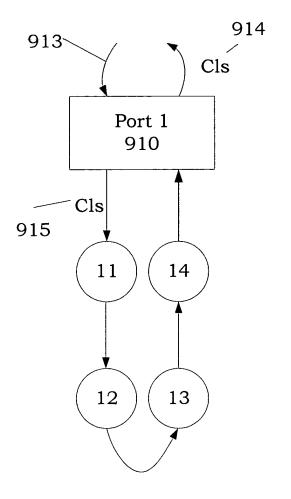
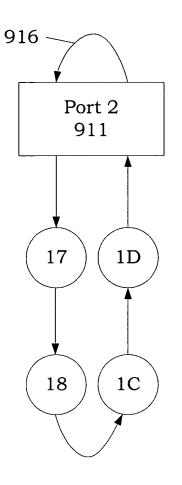


Fig 13a

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 25 of 45 Express Mail No. EV337190972US





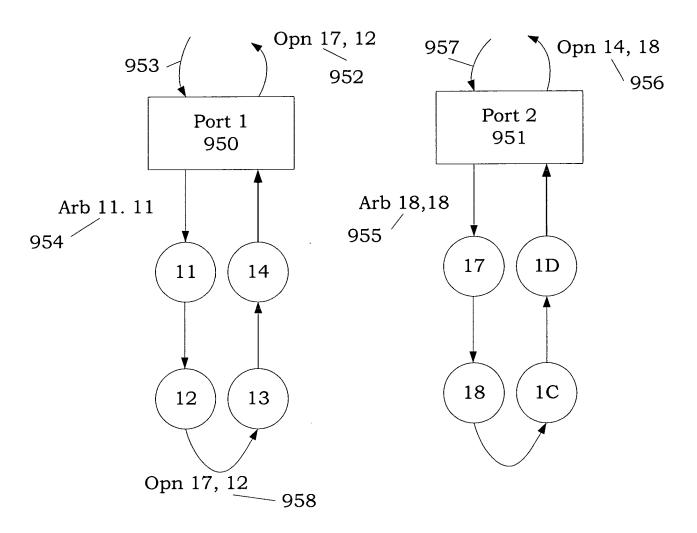
Clsdetected at port receiver from node 12.
Cls sourced from port transmitter.

Port 2 still connected.

Fig 13b

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 26 of 45

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Arbsforwarded. Open sourced.

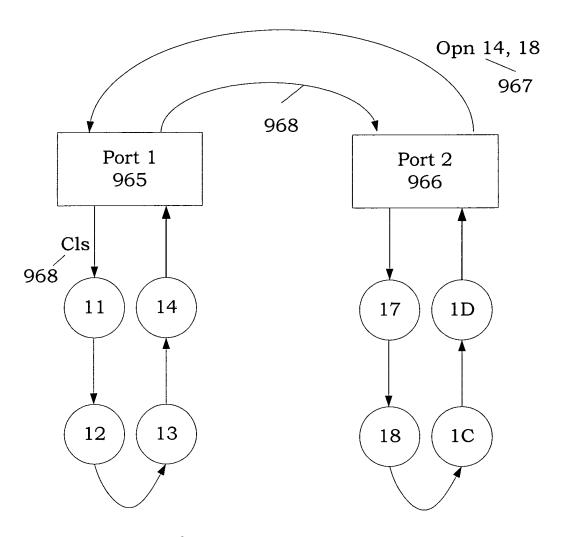
Arbsforwarded. Open sourced.

Fig 14a

Title: Method and Apparatus for Switching
Fibre Channel Arbitrated Loop Devices
Inventor: Greg B. Warren et al.
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Exercise Mail No. EV337190972LIS

Express Mail No. EV337190972US



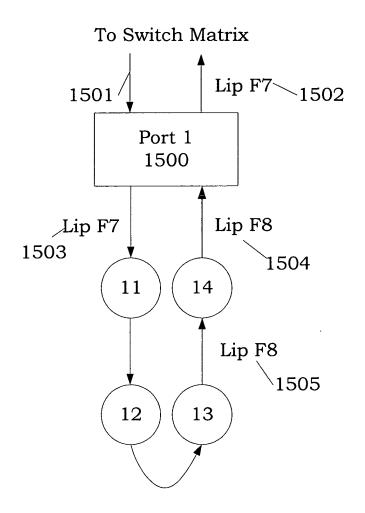
Port 1 connected as destination port.
Cls sourced from Port 1 transmitter.

Port 2 connected as source Port. Open sourced from Port 2 receiver.

Fig 14b

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 28 of 45 Express Mail No. EV337190972US

Router detects Lip RX'd signal. Router deasserts switched mode signal.

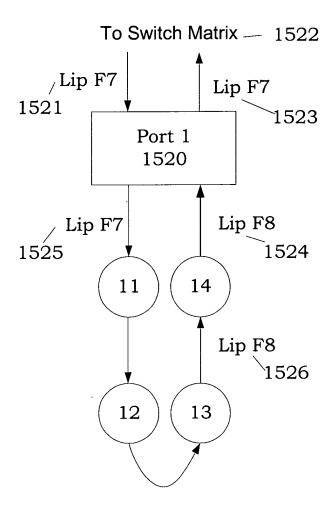


Lip F8 sourced by node 13.
Lip F8 replaced by Lip F7 at port receiver.
Lip F7 sourced at port transmitter.

Fig 15a

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 29 of 45 Express Mail No. EV337190972US

Router detects deassertion of port active. Router takes port out of operational loop.



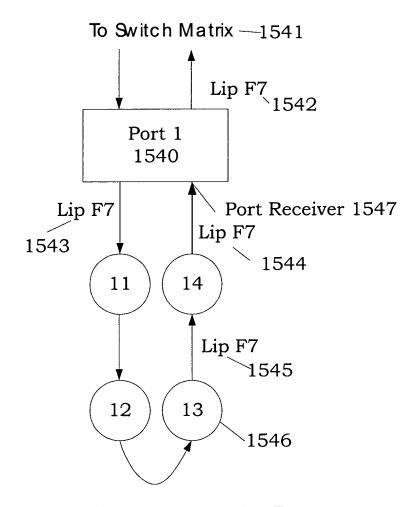
Lip F7 received at port transmitter. Port deasserts port active signal.

Fig 15b

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 30 of 45 Express Mail No. EV337190972US

Router detects Lip RX'd signal since port active is now asserted.

Router puts port back into the operaional loop.

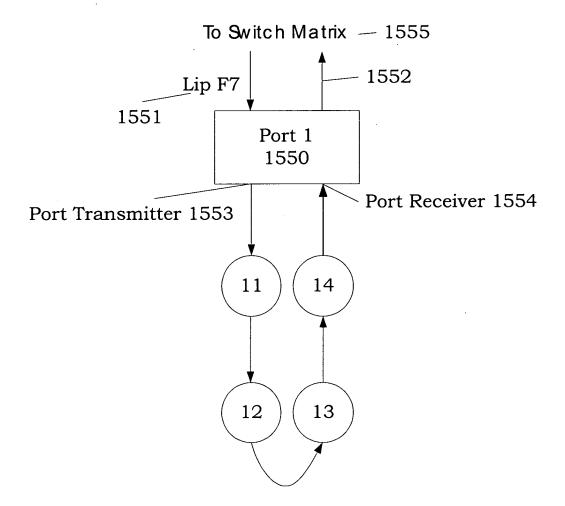


Node 13 "heals", source Lip F7. Lip F7 received at port receiver. Port asserts Port_Active.

Fig 15c

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 31 of 45 Express Mail No. EV337190972US

Router continues with loop initialization



Port detects Lip F7 at port transmitter.
Port stops sourcing Lip F7 at port receiver.
Port stops sourcing Lip F7 at port transmitter.

Fig 15d

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 32 of 45 Express Mail No. EV337190972US

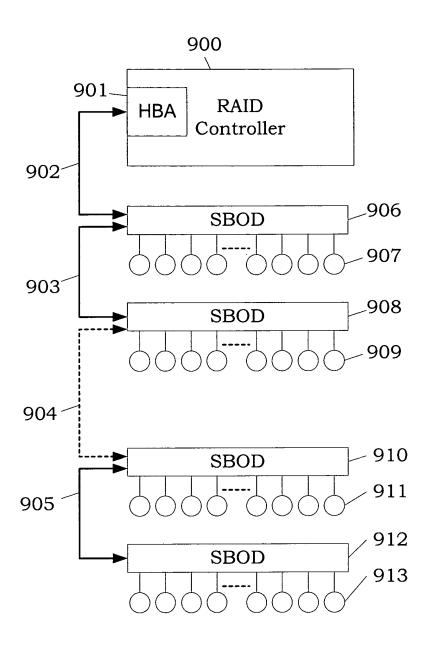


Fig. 16a

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 33 of 45 Express Mail No. EV337190972US

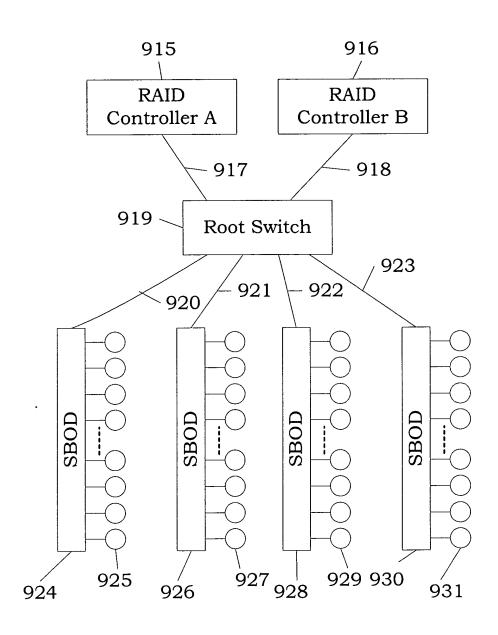


Fig. 16b

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 34 of 45 Express Mail No. EV337190972US

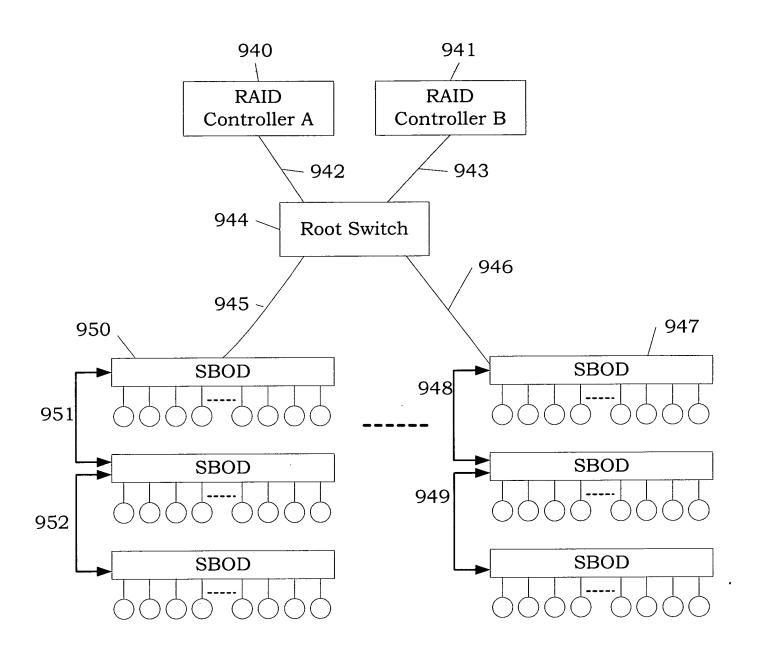


Fig. 16c

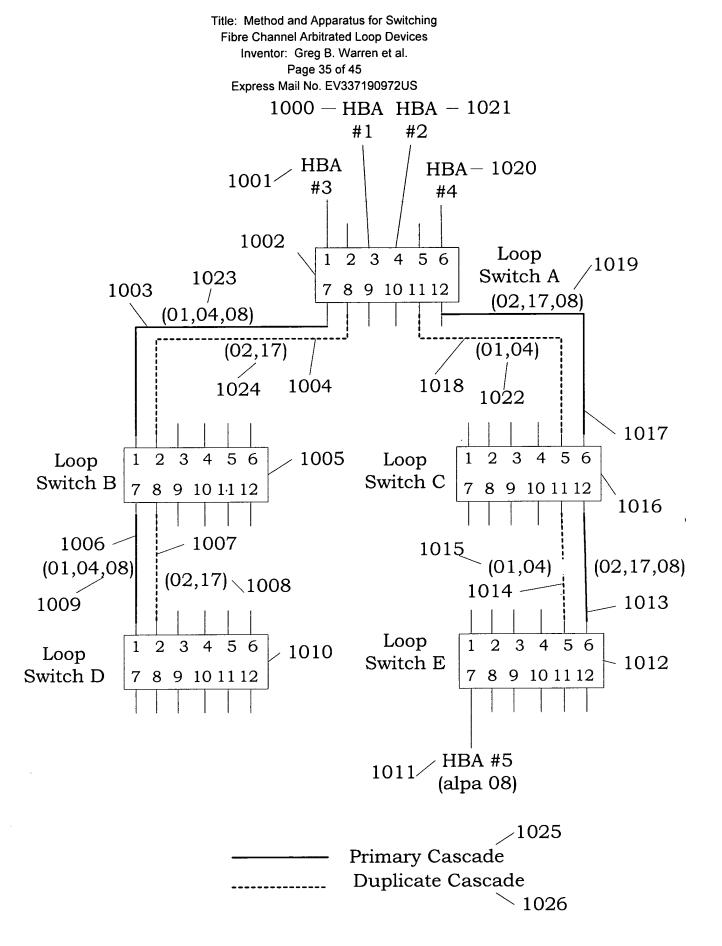


Fig. 17

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 36 of 45 Express Mail No. EV337190972US

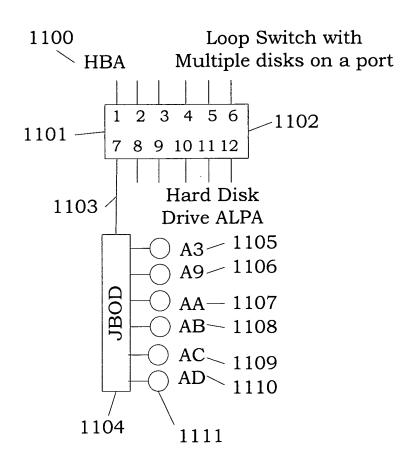
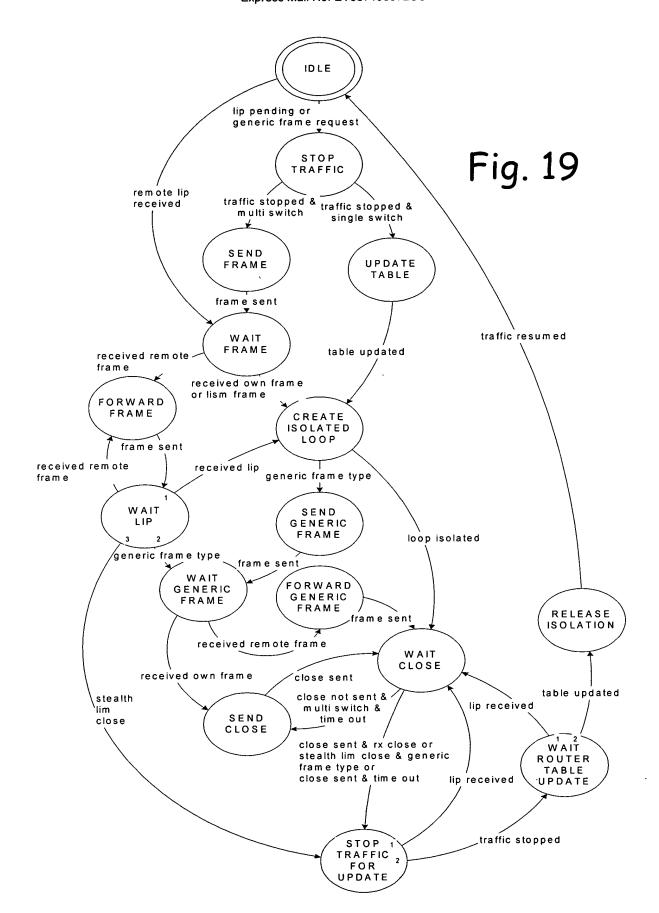


Fig. 18

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 37 of 45 Express Mail No. EV337190972US



Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 38 of 45 Express Mail No. EV337190972US

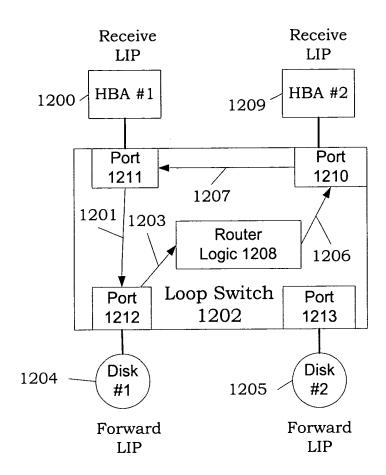


Fig. 20

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 39 of 45 Express Mail No. EV337190972US

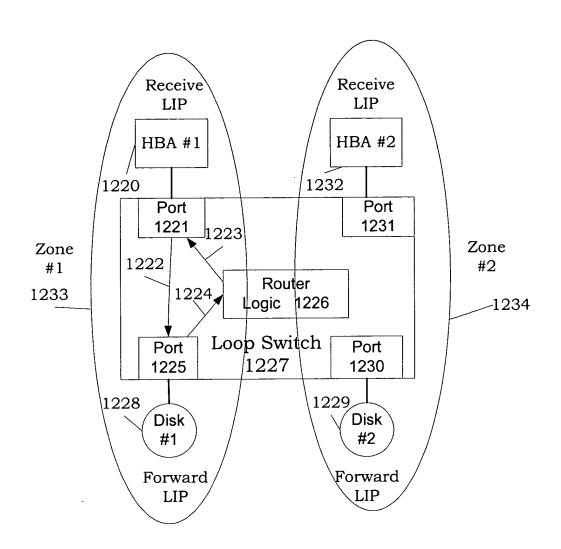


Fig. 21

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 40 of 45 Express Mail No. EV337190972US

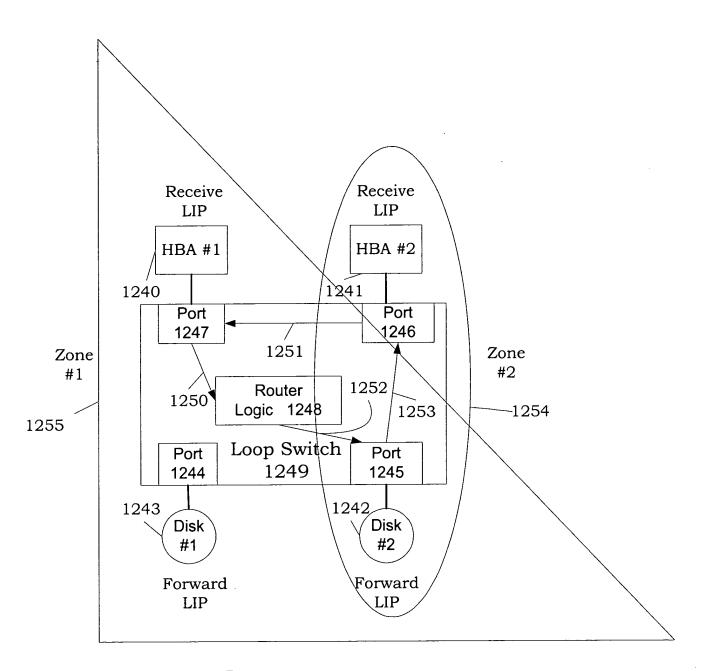


Fig. 22

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 41 of 45 Express Mail No. EV337190972US

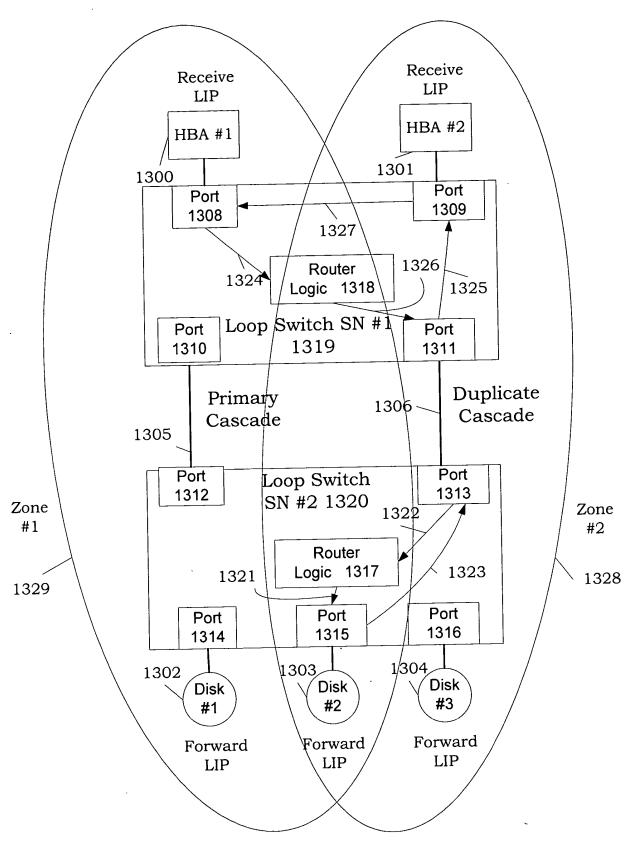


Fig. 23

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 42 of 45 Express Mail No. EV337190972US

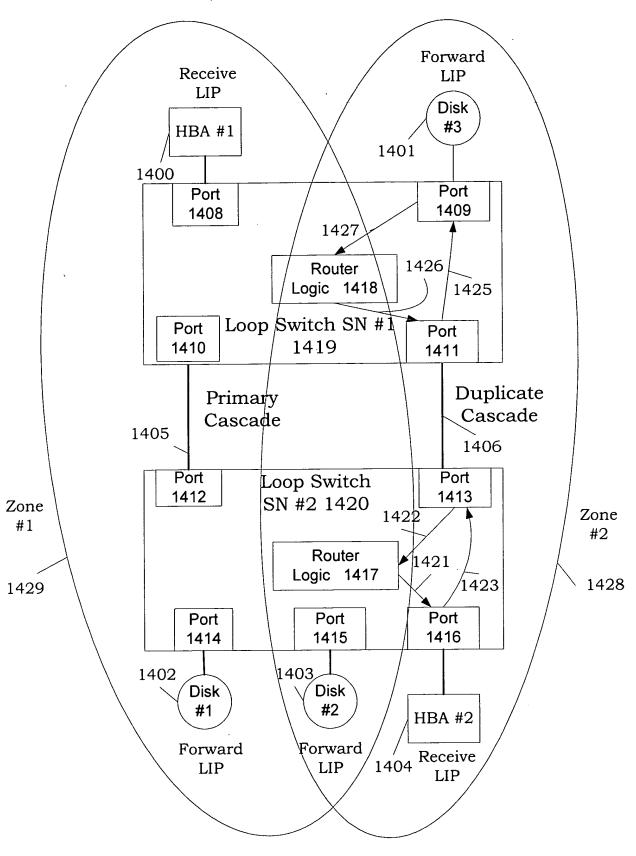


Fig. 24

Title: Method and Apparatus for Switching
Fibre Channel Arbitrated Loop Devices
Inventor: Greg B. Warren et al.
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Express Mail No. EV337190972US

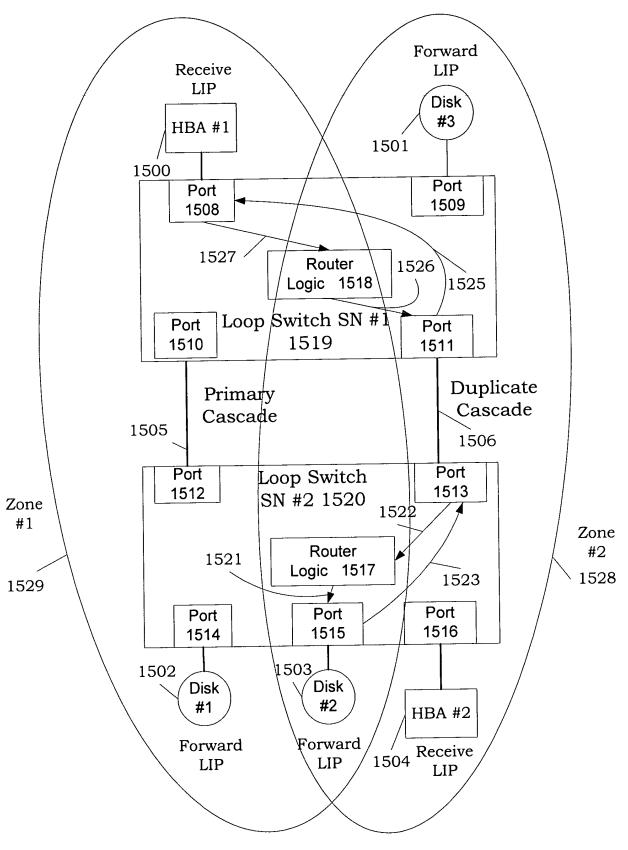


Fig. 25

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 44 of 45 Express Mail No. EV337190972US

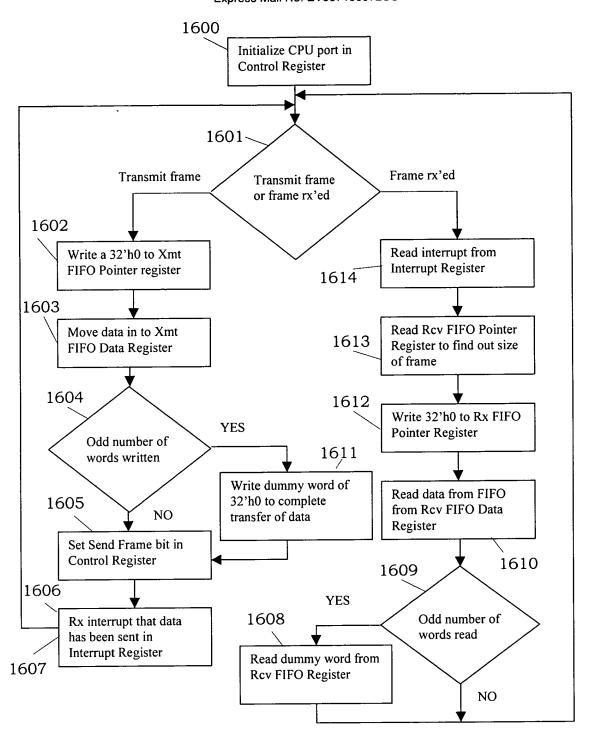


Fig. 26

Title: Method and Apparatus for Switching Fibre Channel Arbitrated Loop Devices Inventor: Greg B. Warren et al. Page 45 of 45 Express Mail No. EV337190972US

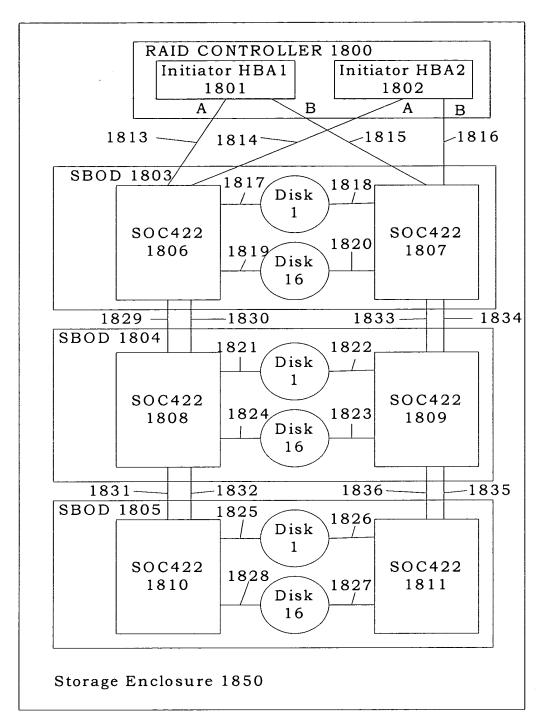


Fig. 27